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10/538,152	06/08/2005	Marie-Catherine Fritsch	2002P18325WOUS	3257

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EXAMINER	
SINGH, HIRDEPAL	
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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/538,152	FRITSCH ET AL.	
	Examiner	Art Unit	
	Hirdepal Singh	2611	

-- *The MAILING DATE of this communication appears on the cover sheet with the correspondence address* --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *28 August 2007*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *13,17,19,23,26,29,31,33 and 34* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *13,17,19,23,26,29,31,33 and 34* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

Response to Arguments

1. Applicant's arguments with respect to claims 13, 26 and 33 have been considered but are moot in view of the new ground(s) of rejection.

2. Applicant argues, "Burgess does not teach providing a predecessor/successor specification in event objects prior to the visual design stage. The visual design stage generates the connection table of FIG 6. This requires expert knowledge during the visual design stage. For example, a visual designer could accidentally reverse the places of the F-to-C converter and the C-to-F converter, thus reversing the Fahrenheit and Centigrade readings on the scroll bars. The connection class CObject does not specify the connections to be made by the interactive graphical programmer, but instead tracks them (col. 4, lines 36-37)... Applicant's invention provides control-relevant information in the descriptions that specifies directed relationships between components... The claim limitation "directed relationships" is clarified herein to explicitly include predecessor/successor relationships."

3. Examiner traverses Applicant's opinion based on the new ground of rejection in combination with previous references. Burgess discloses that the components are connected through their ports, directed relationship of the components are defined (column 3, lines 29-34, lines 54-57; column 4, lines 1-16). Furthermore, Kroeger (US 2002/0165723) in the same field of endeavor discloses a system and method for

controlling a process where the directed relations between system components are defined as predecessor/successor relationships (paragraph 0112). Therefore, it would have been obvious to one of ordinary skill in the art at the time of invention to define the relation between components of the system as predecessor/successor relationships in burgess system in order to get the proper order for the execution of the program based on the priority of the process. The claimed limitations are not novel based on the cited reference, therefore the rejection to the claims still holds.

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

5. Claims 13, 17, 19, 23, 26, 29, 31 and 33-34 are rejected under 35 U.S.C. 103(a) as being unpatentable over Burgess (US 5,805,896), in view of Sakurai et al. (US 6,334,076), in view of Kroeger (US 2002/0165723) and further in view of Elmqvist ("A Uniform Architecture for distributed automation", Advances in Instrumentation and Control, Instrument Society of America, Research Triangle Park, NC US, Vol. 46, Part 2, 1991; Pages, 1599-1608).

Regarding Claims 13 and 26:

Burgess discloses a system and method for producing software/code using links of the components of the system (summary of the invention) comprising:

sending messages between the components through the ports and the data is being transferred between the components (column 2, lines 23-30), therefore it is inherent that the message transfer is taking place as signals through the ports;

the event objects include message information describing the message i.e. information about information, and the derived class provides behavior specific to a type of message i.e. message is the information and type of message is metainformation i.e. information about information (column 2, lines 23-40), also the system components are sending and receiving the temperature data and also converting from one scale to another i.e. Fahrenheit to Centigrade and vice versa (figures 4-7; column 3, lines 20-58), in this case the temperature data is the information and the information whether the temperature scale in Fahrenheit or Centigrade is metainformation i.e. information about information;

producing a program code by interconnecting the signals based on the directed connections of the components (column 4, lines 35-50; producing a class is referred to as a program code).

Burgess discloses all of the subject matter as described above and further discloses that the components have input and output ports, represented by corresponding symbols/functional blocks/modules (column 1, lines 45-64; column 2, lines65-67; column 3, lines 1-19) and; the components are connected through their ports, directed relationship of the components are defined (column 3, lines 29-34, lines

54-57; column 4, lines 1-16), but doesn't specifically teach that (1) the code generation is for a manufacturing and/or processing plants; (2) the components are described in drawing comprising control relevant information in the manufacturing and/or processing plant; (3) the control information described in the drawing is based on the material flow in the manufacturing and/or processing plant; and (4) the system components are defined to have predecessor/successor relationships.

Regarding item (1) above, Examiner notes that this is just an intended use, therefore little if any patentable weight is given. Also, Sakurai in the same field of endeavor discloses a similar system and method for automatically generating a control program/code for plants such as rolling plants, power plants, and chemical plants (abstract, technical field); and regarding item (2) above, Sakurai discloses that the components of the system are represented by functional modules in form of drawings or pictures or graphics based on the control relevant information i.e. operation procedure, and the system is controlled by modifying the drawings or graphics or pictures of the described component modules (column 2, lines 20-51).

Therefore, it would have been obvious to one of ordinary skill in the art at the time of invention to use the disclosed system for code generation in Burgess in a manufacturing and/or processing plant to generate automation code for controlling a manufacturing and/or process plant to allow a person with little programming knowledge to generate the code, and to make system capable of checking and modifying the function of automatically generated code.

Regarding item (3) above, Elmqvist discloses a similar system and method for distributed automation with a graphical programming environment for programming/software generation by graphically connecting the predefined modules (abstract, page 1599; paragraph 4, page 1600), and further discloses that the control information in drawing or graphic is based on the physical objects present in the processing or manufacturing plant as pumps, pump stations, robots, roller tables etc. (paragraph; Object and data flow based language, page 1600). This is inherent that the physical objects of the plant form the path for material or fluid flow as shown in the example of tank system (figures 1-5) i.e. the system is controlling the process based on the material or fluid flow through the tanks, PID (process identifier) controllers, valves, and pumps (Tank system, page 1601).

Therefore, it would have been obvious to one of ordinary skill in the art at the time of invention to use a drawing or picture or graphic having control relevant information based on material flow in a plant for code generation in Burgess in order to combine the graphically represented components i.e. a drawing based on material flow in a plant of Elmqvist for code generation to help make use of the standard designing tools.

Regarding item (4) above, Kroeger in the same field of endeavor discloses a system and method for controlling a process where the directed relations between system components are defined as predecessor/successor relationships (paragraph 0112).

Therefore, it would have been obvious to one of ordinary skill in the art at the time of invention to define the relation between components of the system as predecessor/successor relationships in burgess system in order to get the proper order for the execution of the program based on the priority of the process.

Regarding Claims 17 and 29:

Burgess discloses all of the subject matter as described above and further discloses an input device/means for inputting relevant information for producing software code (column 14, lines12-18; fig 9).

Regarding Claim 19:

Burgess discloses all of the subject matter as described above except for specifically teaching that the method for distributed automation with graphical connection represents information flow, and a data flow model.

Elmqvist in the same field of endeavor discloses that the method for distributed automation with graphical connection represent information flow, and a data flow model (page 1601, paragraph 4; page 1605, paragraph 10).

Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to use the material flow, and/or energy flow, and/or information flow as a basis for mapping the directed relationships between the components in Burgess system in order to use the material flow, and/or energy flow, and/or information flow as a basis for mapping the directed relationships between the

components to make the automation code more effective and error free as the manufacturing and/or processing plant layout and planning is according to the material flow, and/or energy flow, and/or information flow.

Regarding Claims 23 and 31:

Burgess discloses all of the subject matter as described above except for specifically teaching that the system and method is for distributed automation with automated cooperation for distributed objects; and the system could be a central system.

Elmqvist in the same field of endeavor discloses that the system and method is for distributed automation with automated cooperation for distributed objects (page 1599, abstract paragraph 2; page 1605, paragraph 5). However, official notice is taken that it is old and well known within the computer art that if automated code generation is used for distributed system then it could be used for central system too.

Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to use the disclosed system in Burgess for central and/or distributed solutions to use the disclosed system for central and/or distributed solutions to control the distributed components with a central controller or to control the components with a central controller as required.

Regarding Claim 33:

Burgess discloses a system and method for producing software/code using links of the components of the system (summary of the invention) comprising:

the components of the system have input and output ports for data or message communication (column 1, lines 45-64; column 2, lines65-67; column 3, lines 1-19);

the components are connected through their ports for communicating or sending/receiving messages i.e. a communication network between the components of the system, and a controller i.e. a class object controls the communication of messages between the components (column 4, lines 1-50) and the components are connected through their ports, directed relationship of the components are defined (column 3, lines 29-34, lines 54-57; column 4, lines 1-16);

the components have input and output ports, represented by corresponding symbols/functional blocks/modules (column 1, lines 45-64; column 2, lines65-67; column 3, lines 1-19), and the components are connected through their ports, direction of the connection is indicated between input and output ports (column 3, lines 29-34, lines 54-57; column 4, lines 1-16);

producing a program code for the processing or manufacturing plant based on the control information flow and the directed connections of the components (column 4, lines 35-50; producing a class is referred to as a program code).

Burgess discloses all of the subject matter as described above except for specifically teaching that (1) the code generation is for a manufacturing and/or processing plants; (2) the described components of the plant comprising function module and the function module being a reusable software object that defines

characteristics and functions of the elements of the plant; (3) the relationships between system components are defined as predecessor/successor; and (4) the components are described in drawing comprising control relevant information based on material flow in the manufacturing and/or processing plant.

Regarding item (1) above, Examiner notes that this is just an intended use, therefore little if any patentable weight is given. Also, Sakurai discloses a similar system and method for automatically generating a control program/code for plants such as rolling plants, power plants, and chemical plants (abstract, technical field).

Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to use the disclosed system for code generation in Burgess in a manufacturing and/or processing plant to generate automation code for controlling a manufacturing and/or process plant to allow a person with no programming knowledge to generate the code, and to make system capable of checking and modifying the function of automatically generated code.

Regarding item (2) above, Sakurai discloses a similar system and method for automatically generating a control program/code for plants such as rolling plants, power plants, and chemical plants as above, and further discloses that the components of the system are represented by functional modules, and the function modules are reusable or the combination of modules is selected according to the operation and procedure of the plant (column 2, lines 20-51).

Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to use the function module of the components of plant

with connections for communication, as reusable software object for code generation in Burgess to combine the function module as reusable software code, defining functions and characteristics of elements of the plant for code generation to help make use of the standard designing tools.

Regarding item (3) above, Kroeger in the same field of endeavor discloses a system and method for controlling a process where the directed relations between system components are defined as predecessor/successor relationships (paragraph 0112).

Therefore, it would have been obvious to one of ordinary skill in the art at the time of invention to define the relation between components of the system as predecessor/successor relationships in Burgess system in order to get the proper order for the execution of the program based on the priority of the process.

Regarding item (4) above, Sakurai discloses that the components of the system are represented by functional modules in form of drawings or pictures or graphics based on the control relevant information i.e. operation procedure, and the system is controlled by modifying the drawings or graphics or pictures of the described component modules (column 2, lines 20-51). Furthermore, Elmqvist discloses a similar system and method for distributed automation with a graphical programming environment for software generation by graphically connecting the predefined modules (abstract, page 1599; paragraph 4, page 1600), and further discloses that the control information in drawing or graphic is based on the physical objects present in the processing or manufacturing plant as pumps, pump stations, robots, roller tables etc. (paragraph; Object and data

flow based language, page 1600). This is inherent that the physical objects of the plant form the path for material or fluid flow as shown in the example of tank system (figures 1-5) i.e. the system is controlling the process based on the material or fluid flow through the tanks, PID (process identifier) controllers, valves, and pumps (Tank system, page 1601).

Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to use a drawing or picture or graphic having control relevant information based on material flow in a plant for code generation in Burgess to combine the graphically represented components i.e. a drawing based on material flow in a plant of Elmqvist for code generation to help make use of the standard designing tools.

Regarding Claim 34:

Burgess discloses all of the subject matter as described above except for specifically teaching that the control system comprises different zones with subsets of plant elements.

Elmqvist in the same field of endeavor discloses that the control system comprises different zones with subsets of plant elements i.e. the tank system with tank 1, PID 1 is a control zone with PID, valve as subset of elements of system, and PID controller work as the control coordinator as shown in the topology of the network of the system (figures 1-3; pages 1602-1603).

Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to implement the software code generation of Burgess in a system with different control zones with plant elements including controllers. One would have been motivated to implement the generated code in a system with different control zones including plant elements and controllers to make all different components of system work in coordination for optimum results and control.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Hirdepal Singh whose telephone number is 571-270-1688. The examiner can normally be reached on Mon-Fri (Alternate Friday Off)8:00AM-5:00PMEST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Shuwang Liu can be reached on 571-272-3036. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

HS
October 11, 2007

SHUWANG LIU
SUPERVISORY PATENT EXAMINER